AVIDON, D.B., kand.med.nauk; BAIROV, G.A., kand.med.nauk; BUTIKOVA, N.I., dotsent, kand.med.nauk; BOYKOV, G.A., kand.med.nauk; VERESHCHAGINA, L.N., kand.med.nauk; GONCHAROVA, M.N., prof., doktor med.nauk; ZHOLOBOV, L.K., vrach; ZEMSKAYA, A.G., kand.med.nauk; KAYSAR'YANTS, G.A., dotsent, kand.med.nauk; KOLESOV, A.P., doktor med.nauk; KONDRAT'YEV, A.P., kand.med.nauk; KORCHANOV, G.I., kand.med.nauk; KUTUSHEV, F.Kh., kand.med.nauk; LEVINA, O.Ya., kand.med.nauk; LYANDRES, Z.A., prof., doktor med.nauk; MOROZOVA, T.I., kand.med.nauk; MIRZOYEVA, I.I., kand.med.nauk; PANUSHKIN, V.S., kand.med.nauk; RASTORGUYEV, A.V., vrach; RUDAKOVA, T.A., kand.med.nauk; SAVITSKAYA, Ya.V., kand.med.nauk; SVISTUNOV, N.I., vrach; CHISTOVICH, G.V., kand.med.nauk; YAKOVLEVA, T.S., vrach; MARGORIN, Yevgeniy Mikhaylovich, prof., red.; DOLETSKIY, S.Ya., red.; VERESHCHAGINA, L.N., red.; RULEVA, M.S., tekhn.red.

[Operative surgery on children] Operativnaia khirurgiia detskogo vozrasta. Leningrad, Gos.izd-vo med.lit-ry Medgiz, Leningr.otd-nie, 1960. 475 p. (MIRA 13:12)

(CHILDREN--SURGERY)

SAVITSKAYTE, Ye.M., aspirant; PLESHKOV, B.P., kand.biolog.nauk

Methods for quantitative determination of free amino acids in wheat. Izv.TSKHA no.4:96-104 '62. (MIRA 15:12)
(Wheat—Analysis and chemistry) (Amino acids)

SAVITSKI, Y.

"Elosticite de la parol arterielle a l'etat normal et pathologique"

Report submitted for the fourth Intl. Congress of Angiology Prague, Czech, 3-9 Sep 61

L 3898-66 EWT(m)/EWP(w)/T/EWP(t)/EWP(b)/EWA(c) IJP(c) JD/JG

ACC NR: AP5022945 UR/0201/65/000/002/0084/0091

AUTHOR: Savitski, Ya. M.; Tsarow, G. L.

TITLE: Investigation of the effect of interstitial impurities on the structure and properties of tungsten single crystals

SOURCE: AN BSSR. Vestsi. Seryya fizika-tekhnichnykh navuk, no. 2, 1965, 84-91

TOPIC TAGS: interstitial impurity, impurity containing crystal, tungsten, tungsten single crystal, single crystal, carbon containing crystal, oxygen containing crystal, nitrogen containing crystal, crystal structure, crystal property

ABSTRACT: Tungsten single crystals, 4 mm in diameter and 250 mm long, were grown by electron-beam zone melting in a vacuum of $5 \cdot 10^{-5}$ mm Hg. The single crystals contained 0.0012%C and 0.001% each O_2 and N_2. To determine the effect of interstitial impurities on the structure and mechanical properties, the single crystals were artificially contaminated with carbon, oxygen, or nitrogen, vacuum homogenized at about 2000C for 8 hr, and then tested for mechanical strength at 25C. It was found that after impregnation with C in a vacuum of $2 \cdot 10^{-6}$ mm Hg at 1300C for 6 hr, the carbon content in the crystals increased to 0.054%, i.e., almost 45 times. Carbon was present mostly in the form of finely dispersed carbides. Carbon increased the dislocation density from $1.2 \cdot 10^6$ to $1 \cdot 10^7/cm^2$, probably because of the relaxation of internal stresses resulting from the introduction of hexagonal W_2C carbide into the cubic lattice of W. The critical-cleavage stress and the yield strength at 25C increased from 15.7 to 34.1 and from 34.0 to 73 kg/mm^2, respectively. The

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L 3898-66
ACC NR: AP5022945

3

microhardness increased only slightly, but the reduction of area decreased from 100 to 40%, and the NDT temperature rose from -196 to 0C. This is ascribed to the formation of dislocation sources — carbides — in the presence of which the plastic deformation proceeds mainly on account of the multiplication of dislocations. Impregnation with oxygen at 1200C for 48 hr increased the O_2 content in crystals from 0.001 to 0.002% and decreased slightly (by 2.5 kg/mm^2) the critical-cleavage stress. Oxygen had no effect on the ductility of the crystals, but improved somewhat the dislocation density and distribution by reacting with and decreasing the amount of dispersed carbides, thereby ensuring a freer movement and subsequent annihilation of dislocations. Impregnation with nitrogen (at 2300C for 5 hr) brought about no changes in the structure or mechanical properties of the crystals. No nitrides were detected in the crystal structure and, if they were formed, they exist only at the surface or grain boundaries. Orig. art. has: 5 figures and 2 tables. [MS]

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: SS

NO REF SOV: 005 OTHER: 002 ATD PRESS: 4119

Card 2/2 Mk

SAVITSKIS, Yu. Yu.

"The Etiology of Mastitis in Cattle in the Lithuanian SSR." Cand Biol Sci, Inst of Biology, Acad Sci Lithuanian SSR, Vil'nyus, 1954. (RZhBiol, No 1, Jan 55)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (12)
SO: Sum. No. 556, 24 Jun 55

SAVITSKIY, Anatoliy Amufriyevich [Savitski, A.A.], deputat Verkhovnogo Soveta BSSR; KAZACHENOK, G. [Kazachonak, H.], red.; KOLECHITS, G. [Kalechyts, H.], tekhn.red.

[Our practices for obtaining high grain yields] Nash vopyt atrymannia vysokikh uradzhaiau zbozhzhavykh kul'tur. Minsk, Dziarzh.vyd-va BSSR, Red.sel'skahaspadarchai lit-ry, 1960. 26 p. (MIRA 14:3)

1. Nachal'nik kolkhoza "Zarya kommunizma" (for Savitskiy).
(White Russia--Grain)

3(0)
AUTHOR: Savitskiy, A. G. SOV/50-58-10-13/20

TITLE: Building and Operational Experience With Simplified Spillways (Iz opyta stroitel'stva i ekspluatatsii uproshchennykh vodo-slivov)

PERIODICAL: Meteorologiya i gidrologiya, 1958, Nr 10, pp 48-49 (USSR)

ABSTRACT: In the Belorussian SSR, the flow-off from small drainage areas is being studied for many brooks and rivers. At such stagnation points the measurement of water consumption by a vane water meter is impeded due to small depths or velocities which about equal the initial velocity of the vane water meter. The calculation of the flow-off with the required accuracy is often not secured by the measurement of a small water consumption. As the erection of stable concrete water discharges for studying the flow-off of brooks would be time-consuming and expensive, the Gidrologicheskaya stantsiya Minsk (Hydrological Station Minsk) developed a so-called simplified discharge and introduced it in several rivers. This water discharge consists of a bung frame (Fig 1) and a detachable shield (Fig 2). In the middle of the upper edge, the frame has a cutout about as wide as the river bed. It serves for letting through the high-water masses.

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'Building and Operational Experience With Simplified Spillways SOV/50-58-10-13/20

After their drainage, the shield consisting of metal (sheet iron 3 mm, for instance) or light sawn timber is inserted into the cutout. With the use of wood, edges etc. can be reinforced with metal. The insertion point between frame and shield is sealed with rubber or the like. According to the flow intensity and the passage capacity, the shield may have a triangular or trapezoidal cutout. The water discharge is best fitted at a low water level. The shield is removed in high water. Above the water discharge in the river bed, earth dams are erected and the water is let through an escape channel. The water between dams is pumped off. The frame is sealed with kneaded loam in a pit 1.5 m deep, and secured against erosion. The river bed and the new reservoir are cleared of shrubs. Above the water discharge a pile is set into the basin. This pile is adjusted by means of leveling to the edge of the water discharge. The observations, and the determination of the water consumption, are made daily on this pile at 0800 and 2000 hours. The water plants in the reservoir should be mowed in summer. There are 2 figures.

Card 2/2

SAVITSKIY, A.

An academy of peopl's practice. Sov. profzoiuzy 17 no.6:19 Mr '61. (MIRA 14:3)

1. Predsedatel' Latviyskogo respublikanslogo komiteta profsoyuza rabochikh i sluzhashchikh sel'skogo khozyaystva i zagotovok.
(Latvai—Agriculture—Study and teaching)

CHERNAVIN, A., ekonomist (Vladimir-Volynskiy); SHAKHANOV, V., inzh. (Moskva); ARKUSH, N., inzh.; SAVITSKIY, A. (Dneprodzerzhinsk)

Suggested, achieved, introduced. Izobr.i rats. no.9:16-17 S '62. (MIRA 16:3)

(Technological innovations)

MARGULIS, V.S.; MITROV, V.A.; SAVITSKIY, A.G.; NIKOLAYENKO, V.P.

Mastering the technology of the beneficiation of magnetite quartzites at the Northern Mining and Ore Dressing Combine. Gor.zhur. no.3:65-70 Mr '65. (MIRA 18:5)

1. Nauchno-issledovatel'skiy i proyektnyy institut po obogashcheniyu i aglomeratsii rud chernykh metallov, Krivoy Rog (for Margulis, Mitrov, Savitskiy). 2. Krivorozhskiy Severnyy gornoobogatitel'nyy kombinat (for Nikolayenko).

SAVITSKIY, A. I.

Savitskiy, A. I. "The urgent diagnostics of perforating ulcers of the stomach and the ducdenum as one of the forms of 'acute stomach'", Sbornik trudov, posvyashch. prof. Savinykh, Tomsk, 1948, p. 240-52.

So: U-3261, 10 April 1953 Letopis 'Zhurnal 'nykh Statey, No. 12, 1949).

SAVITSKIY, A. I.

"Rakovye Zabolevaniya i Borba s Nimi," 16 pages (Struggle Against Cancerous Diseases), Lecture, Moscow, 1950

SAVITSKII, A. I.

Control of cancer in the Soviet Union. Sovet. med. No. 7, July 50. p. 1-4

CLML 19, 5, Nov., 1950

SAVITSKIY, A. I.

Diagnosis and therapeutic surgery of cancer of the lung. Khirurgiia, Moskva no.8:23-35 Aug. 1950. (CLML 20:1)

1. Of the Central Oncological Institute imeni P. A. Gertsen of the Ministry of Public Health RSFSR.

SAVITSKIY, A.I.

Early diagnosis of cardial and gastric cancer. Khirurgiia, Moskva No.12:3-12 Dec 51. (CIML 21:4)

1. Professor. 2. Of the Central Oncological Institute imeni P.A. Gertsen and of the Department of Oncology of the Central Institute for the Advanced Training of Physicians of the Ministry of Public Health USSR.

SAVITSKIY, Aleksandr Ivanovich, red.

[Problems in experimental and clinical oncology] Voprosy eksperimental'noi i klinicheskoi onkologii. Moskva, Medgiz, 1953. 343 p. (MIRA 13:8)

(TUMORS)

SAVITSKIY, A.I.; SEREBROV, A.I.; SHABAD, L.M.

Review of "Problems of Oncology," vol.13, no.4, edited by A.I.Serebrov, L.M.Shabad. Vest. AMN SSSR no.3:52-55 '53. (MLRA 7:1)

1. Chlen-korrespondent Akademii meditsinskikh nauk SSSR (for Savitskiy). (Tumors)

SAVITSKIY, A.I.

"Problems in oncology." A.I.Serebrov, L.M.Shabad, eds. Reviewed by A.I.Savitskii. Vest AMN SSSR no.2:75-76 '54. (MLRA 7:7)

1. Chlen-korrespondent Akademii meditsinskikh nauk SSSR.
(TUMORS) (CANCER)

SAVITSKIY, A.I., professor

50 years of activity of the P.A.Gertsen State Oncological Institute of the Ministry of Public Health of R.S.F.S.R. Khirurgiia no.6:3-14 Je '54 (MLRA 7:9)

1. Chlen-korrespondent Akademii meditsinskikh nauk SSSR.
(NEOPLASMS,
*P.A.Gertsen State Institute of Oncol. of Ministry of Health of RSFSR, Russia)

SAVITSKIY, A. I.

Summaries of papers presented at the XXVI Congress of Surgeons of the USSR, Moscow, 20 - 27 January 1955, included:

Surgical Treatment of Lung Cancer.

A. I. SAVITSKY

SOURCE: [redacted]A-46013 (Official Publication) Unclassified.

SAVITSKIY, A. I.; professor.

Sixth International Congress on Cancer Control. Khirurgiia, no.4: 73-78 Ap '55. (MLRA 8:9)

1. Chlen-korrespondent AMN SSSR
(NEOPLASMS, cong.)

SAVITSKIY, A.I., professor.

"Clinical aspects of diseases preceding gastric tumors" A.V. Mel'nikov. Reviewed by A.I.Savitskii. Vest.khir.76 no.10: 140-141 N '55. (MLRA 9:1)

1. Chlen-korrespondent Akademii Meditsinskikh nauk SSSR, Moscow. (STOMACH--TUMORS) (MEL'NIKOV, A.V.)

SAVITSKIY, Aleksandr Ivanovich

[Early detection of cancer and modern methods of treating it] Rannee raspoznovanie raka i sovremennoe ego lechenie. Moskva, Medgiz, 1956. 15 p. (MLRA 9:11)

(CANCER)

Savitskiy, Aleksandr Ivanovich

SAVITSKIY, Aleksandr Ivanovich

[Cancer of the lungs] Rak legkogo. Moskva, Medgiz, 1957. 273 p.
(MIRA 11:1)

(LUNGS--CANCER)

[illegible] vol. 11/2 chest dis. Ren 56

317. THE CLINICAL PICTURE IN CANCER OF THE LUNGS AND ITS DIAGNOSIS (Russian text) Savitskiy A. I. KHIRURGIIA 1957, 5 (10-17)

On the base of extensive experience of the Guertzen State Oncological Institute it is pointed out that the early diagnosis of lung cancer in our country, as well as abroad, is still unsatisfactory. This is due to the fact that the practising physicians are not well acquainted with this type of cancer and also due to its anatomical and clinical multiformity. A clinical classification of lung cancer is presented with subdivision of its numerous types according to its original localization. Two fundamental types are thus revealed: the central and the peripheral. Each of these types is further subdivided into 3 groups according to the anatomical form of the growth. Each type has a specific clinical picture. The clinical picture of the central cancer gives early clinical symptoms due to the growth of the tumour into the lumen of a large bronchus with the following complications: atelectasis and obturation pneumonia. Peripheral cancer is for a long time latent, since symptoms appear only in the late stages of this disease, when the tumour invades one of the large bronchi. From that moment the clinical picture of the peripheral cancer is the same as in the central type.

(IX, 5, 15, 16)

SAVITSKIY, A.I., prof.

Clinical aspects and idagnosis of pulmonary cancer. Voen.-med.zhur. no.8:29-36 Ag '57. (MIRA 10:12)

1. Chlen-korrespondent AMN SSSR
(LUNG NEOPLASMS,
clin. aspects & diag. (Rus))

SAVITSKIY, A. I. (Moscow)

"Key Problems of Lung Cancer Suggery."

report presented at the 7th Intl. Cancer Congress, London, July 1958.

SAVITSKIY, A.I., prof., zasluzhennyy deyatel' nauki; ABARBANEL, Ye.E. prof.

Second All-Union Oncological Conference. Klin.med. 36 no.10:144-149 O '58 (MIRA 11:11)

1. Chlen-korrespondent AMN SSSR (for Savitskiy).
(ONCOLOGY)

SAVITSKIY, A.I. (Moskva, B-78, Polshchad' Lermontova, Khoromnyy tupik, d.2, kv. 66)

Key problems of surgical therapy in pulmonary cancer. Vop.onk. 5 no.3:305-308 '59. (MIRA 12:12)

1. Oncological Institute, Moscow.
(LUNG NEOPLASMS, surg.
(Rus))

SAVITSKIY, A.I., prof., zasluzhennyy deyatel' nauki RSFSR

"Manual of general oncology; abridged form for medical students and physicians of all special fields." Reviewed by A.I. Savitskii. Vop. onk. 5 no.9:379-382 '59. (MIRA 12:12)

1. Chlen-korrespondent AMN SSSR.
(ONCOLOGY)

DAVYDOVSKIY, I.V., prof. (Moskva), otv.red.; BLOKHIN, N.N., prof. (Moskva), red.; VASIL'YEV, Yu.M., kand.med.nauk, red.; ZBARSKIY, I.B., prof. (Moskva), red.; ZIL'BER, L.A., prof. (Moskva), red.; KOSYAKOV, P.N., prof., red.; LARIONOV, L.F., prof. (Moskva), red.; SAVITSKIY, A.I., prof. (Moskva), red.; SEREBROV, A.I., prof., red.; CHAKLIN, A.V., kand.med.nauk (Leningrad), red.; SHABAD, L.M., prof. (Leningrad), red.; AVERBAKH, M.M., red.; ROMANOVA, Z.A., tekhn.red.

[Malignant neoplasms; transactions of the Tenth Session of the General Assembly of the Academy of Medical Sciences of the U.S.S.R.] Zlokachestvennye novoobrazovaniia; trudy X sessii obshchego sobraniia Akademii meditsinskikh nauk SSSR. Otvet.red. I.V.Davydovskii. Red.kollegiia: N.N.Blokhin i dr. Moskva, Gos.izd-vo med.lit-ry, 1959. 262 p. (MIRA 14:1)

1. Akademiya meditsinskikh nauk SSSR, Moscow. 10. sessiia, Moscow, 1956. 2. Deystvitel'nyye chleny AMN SSSR (for Davydovskiy, Zil'ber, Serebrov). 3. Chleny-korrespondenty AMN SSSR (for Blokhin, Larionov, Savitskiy, Shabad).
(CANCER)

ANICHKOV, M.N., dots.; ANTELAVA, N.V., prof.; BISENKOV, N.P., kand. med. nauk; BOGUSH, L.K., prof.; GRIGOR'YEV, M.S., prof.; DYSKIN, Ye.A., kand. med. nauk; KEVESH, Ye.L., prof.; KOLESOV, A.P.; KOLESOV, V.I., prof.; KUPRIYANOV, P.A., prof.; LINBERG, B.Z., prof.; MAKSIMENKOV, A.N., prof.; OSIPOV, B.K., prof.; SAVITSKIY, A.I., prof.; UVAROV, B.S.; UGLOV, F.G., prof.; KHOLDIN, S.A., prof.; PETROVSKIY, B.V., prof., otv. red.; BAKULEV, A.N., akademik, red.; GULYAYEV, A.V., prof., red.; YEGOROV, B.G., prof., red.; PANKRAT'YEV, B.Ye., prof., red.; PYTEL', A.Ya., prof., red.; RIKHTER, G.A., prof., red.; FILATOV, A.N., prof., red.; CHAKLIN, V.D., prof., red.; RYBUSHKIN, I.N., doktor med. nauk, red.; RULEVA, M.S., tekhn. red.

[Multivolume manual on surgery] Mnogotomnoe rukovodstvo po khirurgii. Moskva, Medgiz. Vol.5. [Chest surgery; thoracic wall, pleura, and lungs] Khirurgiia grudi; grudnaia stenka, plerva i legkie. 1960. 727 p. (MIRA 15:3)

1. Chlen-korrespondent Akademii meditsinskikh nauk SSSR (for Antelava, Bogush, Maksimenkov, Savitskiy, Kholdin, Chaklin).
2. Deystvitel'nyy chlen Akademii meditsinskikh nauk SSSR (for Kupriyanov, Petrovskiy, Yegorov).
(CHEST--SURGERY)

SAVITSKIY, A.I., prof.

Early diagnosis of lung cancer. Terap.arkh. 33 no.1:3-9 '61. (MIRA 14:3)

1. Iz kafedry onkologii TSentral'nogo instituta usovershenstvovaniya vrachey Ministerstva zdravookhraneniya SSSR na baze Gosudarstvennogo onkologicheskogo instituta imeni P.A. Gertsena. Deystvitel'nyy chlen AMN SSSR.
(LUNGS--CANCER)

SAVITSKIY, A.I., prof. (Moskva)

Cancer control in the U.S.S.R. and its immediate tasks. (MIRA 15:8)
Khirurgiia no.8:3-10 Ag '62.

1. Deystvitel'nyy chlen AMN SSSR.
(CANCER)

SAVITSKIY, A.I., prof.; NOVIKOV, A.N., prof.

Report on plenum of the All-Union Scientific Medical Society of Oncologists. Vop. onk. 11 no.8:115 '65.

(MIRA 18:11)

L 38558-66 EWT(m)/EWP(w)/EWP(v)/T/EWP(t)/ETI/EWP(k) IJP(c) JD/HM/GD

ACC NR: AT6012405 SOURCE CODE: UR/0000/65/000/000/0295/0300

AUTHORS: Guseva, Ye. A.; Komarov, M. A.; Vorob'yeva, L. P.; Savitskiy, I. A.

ORG: none

TITLE: Structural and property changes of the basic metal and welded joints of alloy VT15 during heat treatment

SOURCE: Soveshchaniye po metallokhimii, metallovedeniyu i primeneniyu titana i yego splavov, 6th. Novyye issledovaniya titanovykh splavov (New research on titanium alloys); trudy soveshchaniya. Moscow, Izd-vo Nauka, 1965, 295-300

TOPIC TAGS: METAL AGING, MECHANICAL PROPERTY titanium alloy, metal welding, metal property, weld heat treatment / VT15 titanium alloy

ABSTRACT: The aging process of the basic metal and welded joints of alloy VT15 was experimentally investigated on specimens which (after quenching in water from 800C) had the following properties: σ_2 = 101.5 kg/mm^2, $\sigma_{0.2}$ = 100.7; δ = 11.7%, α = 6.2 kg/cm^2, bending angle = 75°. The structural, mechanical, and electrical resistance changes after heat treatment were investigated. Quenching temperatures were varied from 650--1100C (quenching in water after 15 min at temperature) and aging temperatures from 300--600C. Curves of resistivity and α as a function of quenching and aging temperature are presented along with sample photographs of the corresponding microstructures, and the results are summarized in two tables. It was

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ACC NR: AT6012405

found that quenching temperature had little effect on the mechanical properties and microstructure of the base alloy but did affect the metal resistivity (maximum for 800-900C). All the welded joint properties were affected by both the quenching and aging temperatures. It was concluded that the kinetics of structural and phase transformations during heat treatment is different for the base alloy and the welded joints and thus requires detailed study. M. V. Polyanski performed the electron-microscopic studies of the joints. Orig. art. has: 2 tables and 5 figures.

SUB CODE: 11, 13/ SUBM DATE: 02Dec65/ ORIG REF: 003

Card 2/2

SAVITSKIY, A. N.

AKSMAN, N.M.; VILENSKIY, L.I.; GORBUNOV, N.G.; GUBSKIY, V.N.; GURVICH, M.D.; LATYSHEV, Yu.M.; LEVOINTIN, L.I.; LIVSHITS, T.G.; LOGINOVA, M.K.; LUR'YE, D.A.; LYANDRES, G.D.; MIROSHNICHENKO, G.K.; MOGILEVSKIY, B.Ya.; NEMKOVSKIY, M.I.; ORLEANSKIY, Ya.P.; SAVITSKIY, A.N.; SIMMA, S.F.; SURKOV, G.Z.; SHMYGUL', B.P.; SHUBIN, V.P.; DONSKOY, Ye.Ye., red.izd-va; KAL'NITSKIY, R.Ya., red.izd-va; ZAMAKHOVSKIY, L.S., tekhn.red.

[Mechanization and automation in the machinery industry] Mekhanizatsiia i avtomatizatsiia v stankostroenii. Khar'kov, Khar'kovskoe obl.izd-vo, 1958. 119 p. (MIRA 13:2)

1. Kharkov. Institut "Giprostanok." 2. Direktor instituta "Giprostanok" (for Orleanskiy).
(Machinery industry--Technological innovations)
(Automation)

SOV/137-58-10-21532

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 10, p 154 (USSR)

AUTHORS: Zhdanova, V. N., Savitskiy, A. P., Stolyarova, V. N.

TITLE: Temperature Stability of Distortions in Copper and its Alloys (Temperaturnaya ustoychivost' iskazheniy v medi i yeye splavakh)

PERIODICAL: Dokl. 7-y Nauchn. konferentsii, posvyashch. 40-letiyu Velikoy Oktyabr'sk. sots. revolyutsii, Nr 2. Tomsk, Tomskiy un-t, 1957, p 60

ABSTRACT: Temperature stability of distortions in Cu and in Cu-Al, Cu-Zn, and Cu-Ni alloys was studied by means of X-ray diffraction analyses and measurements of microhardness. Temperature intervals for primary recrystallization were established. The energy of activation of recrystallization process was calculated from X-ray diffraction-pattern data obtained in investigations of the initial recrystallization. The rate of progress of softening of the alloys was computed from data obtained by microhardness measurements of specimens after the latter had been annealed at different temperatures. A fastest rate of softening was observed in the Cu-Zn alloy. Isothermal recovery curves were plotted for Cu and its alloys. 1. Copper--Deformation 2. Copper--Temperature factors 3. Temperature--Stability

Z.F.

Card 1/1

ZHDANOVA, V.N.; SAVITSKIY, A.P.; STOLYAROVA, V.I.

X-ray analysis of the temperature stability of defects in deformed copper and its alloys. Izv. vys. ucheb. zav.; fiz. no.2:15-22 '58. (MIRA 11:6)

1.Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosudarstvennom universitete imeni V.V. Kuybysheva.
(Copper alloys--Testing)
(Metals, Effect of temperature on)

PHASE I BOOK EXPLOITATION SOV/4502

Akademiya nauk SSSR. Nauchnyy sovet po problame zharoprochnykh splavov

Issledovaniya po zharoprochnym splavam, tom 6 (Investigations of Heat-Resistant Alloys, Vol. 6) Moscow, 1960. 319 p. Errata slip inserted. 3,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut metallurgii imeni A. A. Baykova. Nauchnyy sovet po probleme zharoprochnykh splavov.

Editorial Board: I. P. Bardin (Deceased) Academician, G. V. Kurdyumov, N. V. Ageyev, Corresponding Member, Academy of Sciences USSR (Resp. Ed.), I. A. Oding, I. M. Pavlov, and I. F. Zudin, Candidate of Technical Sciences; Ed. of Publishing House: V. A. Klimov; Tech. Ed.: S. G. Tikhomirova.

PURPOSE: This book is intended for research workers in the field of physics of metals and for metallurgists, particularly those working on heat-resistant alloys.

COVERAGE: This collection of 45 articles deals with various problems in the production of heat-resistant alloys. Special attention is paid to the mechanisms of deformation of such metals as aluminum, copper, iron, and nickel. Various defects and failures of metals are analyzed, and means for increasing the heat resistance and plasticity are described. Among the special problems discussed are: electrolytic conductivity of iron-aluminum alloys in the solid state; the mobility of atoms in nickel-iron alloys, depending upon defects of their crystalline structure; the kinetics of change in isolated pores; the irreversible thermal transformation of solid bodies, etc. No personalities are mentioned. References follow each article.

3/

SAVITSKIY, A.P.

40982

S/659/62/009/000/016/030
I003/I203

AUTHORS Savitskiy, K. V., Zhdanova, V. N., Savitskiy, A. P. and Kulkov, V. A.

TITLE On strengthening of metals by dispersed particles

SOURCE Akademiya nauk SSSR. Institut metallurgii. Issledovaniya po zharoprochnym splavam v. 9. 1962. Materialy Nauchnoy sessi po zharoprochym splavam (1961 g.), 119–126

TEXT: The above subject has recently been widely investigated. In the present work the crystalline structure of a deformed sintered Cu-Al_2O_3 alloy was investigated by mechanical tests and by X-ray analysis. It is concluded that in the Cu-Al_2O_3 system in which the Al_2O_3 particles are practically insoluble, the mean dimensions of the blocks of the mosaic structure are smaller the higher the concentration of the strengthening phase, and the samller the dimensions of its particles. The production of heat-resistant metals with a high degree of hardness and high melting points which contain fine insoluble inclusions is very promising. In the discussion, A. Ya. Shinyayev suggested that the diffusion of such oxide inclusions in metals should be investigated, and thus throw light on the possible use of this method for the production of heat-resistant alloys V V Grigor'yeva stressed that great attention should be paid to the problems discussed in the present article There are 4 figures and 1 table

Card 1/1

S/139/62/000/006/010/032
E073/E335

AUTHORS: Savitskiy, K.V., Zhdanova, V.N., Savitskiy, A.P., Kulikov, V.A. and Maslovskaya, T.I.

TITLE: The relationship between the mechanical properties and the porosity of copper produced from powder

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, no. 6, 1962, 57 - 63

TEXT: The hardness and the compression strength in the as-sintered state and after deformation of 10, 20, 30% (for compression strength) and 50% (for hardness) were determined on cylindrical samples of 1-6% porosity, 12-15 mm high, 7 mm in diameter, prepared from powder passed through a sieve with a 50-μ mesh. The hardness-porosity and compressive strength-porosity curves pass through maxima for about 2.4% porosity and both the hardness and compressive strength were the higher the higher the degree of deformation. The hardness of all the samples was equal to or greater than that of cast copper, which could be explained by the existence of fine micropores formed as a result of powder-metallurgical proparation. X-ray diffraction photographs

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The relationship between ....

(breadth of the (331) line) showed that the block structure of copper produced from powder was finer than that of cast copper and this could influence the strength by blocking dislocations and forming a fine mosaic structure. The degree of distortion of the internal structure was estimated from X-ray diffraction photographs. The recrystallization temperature of a metal with an inertia porosity of 2.4% and deformed by 20% was 600 °C; the recrystallization temperature decreases with increasing porosity and forged copper produced from powder as the lowest recrystallization temperature, which may even be lower than that of cast copper. Double pressing with intermediate annealing and subsequent sintering at a moderately high temperature yields material of a higher strength than single pressing followed by long-duration sintering at elevated temperatures. There are 4 figures.

ASSOCIATION: Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosuniversitete imeni V.V. Kuybyshеva (Siberian Physicotechnical Institute of Tomsk State University imeni V.V. Kuybyshev)

SUBMITTED: November 21, 1961

L 22509-65 EWT(m)/T/EWP(t)/EWP(b) IJP(c) JD/MLK

ACCESSION NR: AT4046814 S/0000/64/000/000/0044/0049

AUTHOR: Savitskiy, A.P.; Savitskaya, L.K.

TITLE: Effect of impurities on pore formation along the grain boundaries

SOURCE: AN SSSR. Nauchny*y sovet po probleme zharoprochny*kh splavov. Issledovaniya staley i splavov (Studies on steels and alloys). Moscow, Izd-vo Nauka, 1964, 44-49

TOPIC TAGS: grain boundary, pore formation, technical cadmium, cadmium impurity, cadmium hardness, cadmium quenching, cadmium annealing, vacancy diffusion, volume diffusion

ABSTRACT: This paper is devoted to a clarification of the mechanism of pore formation along the grain boundaries of cadmium during repeated quenching, and to the effect of impurities on this process. Specially prepared technical cadmium was used for the samples; one half were tested after repeated quenching in water (1-30 times from 300C) the other half after annealing at 300C for one hour with slow cooling. The grain size, microscopic hardness, density and rate of contact melting were measured. Pores were clearly visible on the photomicrographs of the grain boundaries of technical cadmium after 10 quenching cycles. The mechanism of cadmium pore formation was found to be of the vacancy diffusion type. The increase in contact melting speed after the first quenching

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L 22509-65
ACCESSION NR: AT4046814

gradually changed to a decrease during subsequent quenching. After 5 quenching cycles the speed was equal to its initial value for unquenched samples, and after 30 cycles it was decreased 50%. The grain boundaries not only did not promote the penetration of the liquid phase into the interior of the sample, but even retarded this process. A number of reasons are given for the decrease in the contact melting speed. A study of technical cadmium subjected to repeated quenching and subsequent high-temperature annealing indicated that the impurities found along the grain boundaries during quenching accumulate slowly, but with sufficient speed so that diffusion of the internal grains can be detected. It is evident that the clogging of pores occurs as the impurities leave the boundaries. As a result of this study, new experimental data were obtained which indicate that the pores along the grain boundaries arise by means of the volume diffusion of the excess vacancies and atomic impurities. In the absence of impurities, pores are not produced or at least their formation is strongly inhibited. "The authors thank M. B. Makogan for supplying the pure cadmium." Orig. art. has: 3 figures.

ASSOCIATION: None

SUBMITTED: 16Jun64 ENCL: 00 SUB CODE: MM

NO REF SOV: 019 OTHER: 012

Card 2/2

ACCESSION NR: AP4036566 S/0139/64/000/002/0110/0115

AUTHORS: Savitskiy, A. P.; Itin, V. I.; Zhdanova, V. N.; Kozlov, Yu. I.

TITLE: On problem of excess vacancy sources formed during sintering of metallic powders

SOURCE: IVUZ. Fizika, no. 2, 1964, 110-115

TOPIC TAGS: metallic powder, sintering, cake porosity, initial porosity

ABSTRACT: An experimental investigation was made to verify theoretical conclusions on the influence of the heating rate in metallic powder sintering. Copper powder (50 μ size) of galvanic origin was used to prepare 15- to 20-mm cylindrical specimens (7 mm in diameter) in a double-sided press. The sintering was carried out in 5×10^{-3} Hg vacuum at a temperature of 900C for one hour. One set of specimens was heated at an average rate of 1.5 degrees per minute and the other at 200 degrees per minute. A graph (depicting final cake porosity versus initial porosity for both heating rates) and 170-magnification photographs of the pore sizes in the two specimens show that for small initial porosity under elevated pressures the use of slow heating rates to sintering temperatures gives rise to a

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ACCESSION NR: AP4036566

smaller expansion in the cakes than fast heating rates. Similarily, high heating rates generate larger pore sizes than slow heating rates. The results confirm the authors' predictions of diffusion mechanisms governing sintering porosity in crystalline materials. Orig. art. has: 3 formulas and 2 figures.

ASSOCIATION: Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosuniversitete imeni V. V. Kuyby*sheva (Siberian Physicotechnical Institute at Tomsk State University)

SUBMITTED: 01Mar63 DATE ACQ: 05Jun64 ENCL: 00

SUB CODE: MM NO REF SOV: 012 OTHER: 003

Card 2/2

SAVITSKIY, A.P.

Interpretation of radioscopy materials in the continuous recording of the field strength curve. Vop.razved.geofiz. no.4:5-8 '64. (MIRA 19:1)

L 6748-65 EWT(m)/EWP(q)/EWP(b) IJP(c)/BSD/ASD(m)-3 JD 50 49

ACCESSION NR: AP4043865 S/0139/64/000/004/0035/0040

AUTHORS: Savitskiy, A. P.; Itin, V. I.; Kozlov, Yu. I.; Zhdanova, V. N.; Kulikov, V. A.

TITLE: Resistance of metal-ceramic copper to compression at increased temperatures 27 18

SOURCE: IVUZ. Fizika, no. 4, 1964, 35-40

TOPIC TAGS: x ray diffraction study, metal ceramic material, ceramic sintering, ceramic thermal stability, ceramic pressing, compression resistance

ABSTRACT: To check on the influence of the manufacturing regime on the mechanical properties of metal-ceramic copper, the authors tested for compression, at 20, 350, and 500C, metal-ceramic copper obtained by triple pressing and sintering at different temperatures (250--1000C), with porosity 3--6%. The samples were made of elec-

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trolytic copper powder with particle size smaller than 50 microns, pressed at 1.5 ton/cm^2, and sintered at 250, 400, 550, 700, 850, and 100C. The samples were pressed again after sintering at 5 tons/cm^2, sintered again at the corresponding temperature, and again pressed at 5 tons/cm^2. The results show that a metal-ceramic copper multiply pressed and sintered at low temperatures, has a higher resistance to compression at room temperature than metal subjected to high-temperature sintering, but is not as resistant to compression at high temperatures as is a ceramic prepared at high temperatures. The loss of strength is found to be due to partial annealing, as determined by the width of the (331) x-ray line of the sample. Measurements of the width of the x-ray line have established that recrystallization of the metal ceramic copper takes place during the sintering process in the temperature interval 300--350C. A hypothesis is advanced that the weakening of the metal-ceramic copper during compression at high temperatures is due to interaction between dislocations and vacancies, which enter the lattice upon dissolution of

L 6748-65
ACCESSION NR: AP4043865

the small pores or because of the presence of a very highly developed boundary net. Orig. art. has: 6 figures.

ASSOCIATION: Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosuniversitete imeni V. V. Kuyby*sheva (Siberian Physicotechnical Institute at the Tomsk State University)

SUBMITTED: 03Jan64 ENCL: 00

SUB CODE: MT, OP NR REF SOV: 017 OTHER: 006

Card 3/3

L 11360-65 EWP(e)/EWT(m)/EWP(k)/EWP(t)/EWP(b) Pf-4 IJP(c)/BSD/ASD(m)-3 JD

ACCESSION NR: AP4044911 S/0226/64/000/004/0058/0064

AUTHOR: Savitskiy, A. P., Zhdanova, V. N., Girya, E. N.

TITLE: Effect of the sintering temperature on the strength of copper powder following multiple pressing

SOURCE: Poroshkovaya metallurgiya, no. 4, 1964, 58-64

TOPIC TAGS: powder metallurgy, copper powder, sinter point, sintered copper powder, multiple pressing, sintering

ABSTRACT: In a recent paper, K. V. Savitskiy et al. noted that the mechanical properties, as well as the temperature of beginning of recrystallization, varied for samples of sintered copper with similar porosity. The present paper therefore considered the relationship between mechanical properties, porosity, structure, sintering temperature and the number of cycles of pressing. The samples used for analysis were made of electrolytic copper by two-sided pressing at 1.5 metric tons/sq. cm. The samples were 15 mm high and 7mm in diameter. Sets of samples were sintered at 250, 400, 550, 700, 850 and 1000C. After initial sintering, 10% of the samples were removed and the rest were pressed at 5 tons/cm^2 and resintered until the Vickers hardness remained unchanged. Prior to compression tests all samples were cut to a similar height of 11 mm and

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annealed at 400C, except that samples sintered at only 250C were annealed at 250C. Fig. 1 of the Enclosure shows the relationship between copper powder porosity and the number of pressing and sintering cycles for various sintering temperatures. At high sintering temperatures (1000C), shrinkage is high for initial sintering. Heating is required after pressing to lower the resistance of powder particles to further pressing, to increase particle bonding, and to remove gases from the pores. Multiple pressing does not result in a noticeable lowering of porosity, since the pores are closed and the gas cannot be removed. Fig. 2 of the Enclosure shows the relationship between copper powder hardness and the number of pressing cycles. The greatest change in hardness is observed at low sintering temperatures, especially for the first three cycles. In these cases, the hardness of sintered copper may be twice as high as for cast copper. The results of compression tests are shown in Fig. 3 of the Enclosure. On the basis of available publications and analysis of the authors' experiments, it is concluded that sintered copper has pores, lacks oxides and has a higher grain size than cast copper. Analysis also shows that samples sintered at lower temperatures have lower porosity. Considering the problem of copper powder recrystallization temperature, it should be remembered that a solid solution of copper and oxygen is present, not pure copper, since oxide alloy is formed at the beginning of recrystallization. It was found that practically all samples, when sintered at 250C, were plastic under compression. They did not fall apart even when deformed 50%.

L 11360-65
ACCESSION: AP4044911

Even in the worst cases, samples sintered at 250C remained intact when deformed 30%. It thus seems that sintered copper after multiple pressing is stronger than cast copper, and that a low sintering temperature is sufficient for obtaining copper powders of low porosity. Orig. art. has: 4 figures.

ASSOCIATION: Sibirskiy fiziko-tekhnicheskiy nauchno-issledovatel'skiy institut (Siberian Scientific Research Institute for Physics and Technology)

SUBMITTED: 12Mar63 ENCL: 03 SUB CODE: MM

NO REF SOV: 009 OTHER: 002

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L 11360-65
ACCESSION NR: AP4044911

ENCLOSURE: 03

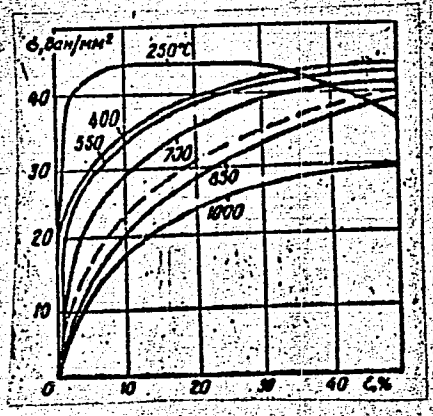

Fig. 3. Relationship between the true compressive strength of sintered copper powder after triple pressing and sintering and the degree of deformation. The dashed curve is for technically pure copper. Ordinate = dan/mm^2.

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L 11360-65
ACCESSION NR: AP4044911

ENCLOSURE: 02

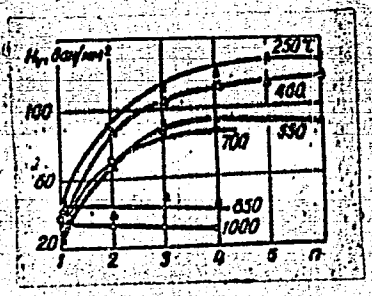

Fig. 2. Relationship between sintered copper powder hardness and the number of pressing and sintering cycles. Ordinate = dan/mm², where 1 dan = 1.02 kg.

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L 11360-65
ACCESSION NR: AP4044911

ENCLOSURE: 01

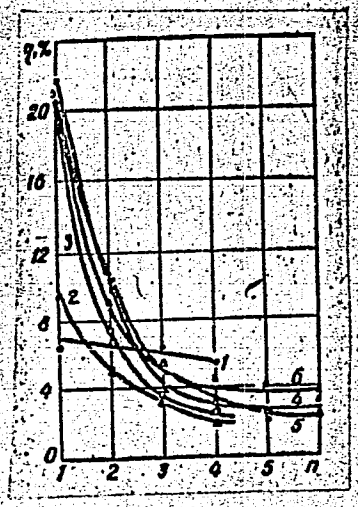

Fig. 1. Relationship between sintered copper powder porosity and the number of pressing and sintering cycles. Sintering temperature, deg. C: 1 - 1000; 2 - 850; 3 - 700; 4 - 550; 5 - 400; 6 - 250.

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L 11971-65 EWT(m)/EPR/EWP(k)/EWP(e)/EWP(t)/EWP(b) Pf-4/Ps-4 SSD/AFETR/ASD(m)-3/AFWL/BSD JD

ACCESSION NR: AP4047346 S/0139/64/000/005/0034/0037

AUTHORS: Savitskiy, A. P.; Kozlov, Yu. I.; Itin, V. I.; Savitskiy, K. V.; Zhdanova, V. N.

TITLE: Effect of porosity on the mechanical properties of metal-ceramic copper and a Cu-Al alloy

SOURCE: IVUZ. Fizika, no. 5, 1964, 34-37

TOPIC TAGS: copper alloy, copper, metal ceramic material, porosity, mechanical property, hardness, powder metallurgy

ABSTRACT: In view of the lack of experimental data on the effect of low porosity on the mechanical properties, the authors investigated the dependence of the hardness and resistance to compression of copper and of Cu-Al alloy, prepared by powder-metallurgy methods, on the porosity. The preparation of the metal-ceramic samples is the same as described by A. P. Savitskiy et al (Poroshkovaya metallurgiya

Card 1/2

L 11971-65
ACCESSION NR: AP4047346

[Powder Metallurgy], in press). The copper samples were sintered at 250, 400, 550, 700, and 850°, while the Cu-Al alloy (10 atomic percent) were sintered at 500° with subsequent hot pressing at the same temperature. The porosity ranged between 0.3 and 15%. The results indicate that although the mechanical properties of a material with low porosity can exceed the corresponding properties of the cast material, owing to certain features of the structure, the dependence of these properties on the porosity remains linear, as established in earlier research. Orig. art. has: 3 figures.

ASSOCIATION: Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosuniversitete im. V. V. Kuyby*sheva (Siberian Physicotechnical Institute at the Tomsk State University)

SUBMITTED: 26Feb64 ENCL: 00

SUB CODE: SS, MM NR REF SOV: 008 OTHER: 004

Card 2/2

L 15795-65 EWT(m)/EWP(w)/EWA(d)/EWP(t)/EWP(b) IJP(c) JD S/0126/64/017/006/0886/0891

ACCESSION NR: AP4042047

AUTHOR: Savitskiy, A. P.; Savitskaya, L. K. B

TITLE: Investigation of pore formation in cadmium after repeated hardening 18 27 18

SOURCE: Fizika metallov i metallovedeniye, v. 17, no. 6, 1964, 886-891

TOPIC TAGS: Cd, porosity, vacancy diffusion, microhardness, dislocation loop, hardening

ABSTRACT: Although porosity which leads to cracking 18 and intercrystalline failure during tensile tests has been the subject of numerous investigations, there is no unanimous theory on the nature of this imperfection. The authors undertook a study of porosity after repeated hardening of 3.5 mm diam. and 8 mm long Cd wire rod specimens. Six-hour annealing at 300 C was followed by furnace cooling, and repeated water quenching in cycles of 1 to 30 times. Density and microhardness were measured by standard methods. Boundary porosity was visible after the third hardening and density adversely affected. The authors attribute the boundary porosity to the diffusion of vacancies in the grain volume. They contend that the excessive number of vacancies which forms after each hardening affect the mechanical

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L 15795-65
ACCESSION NR: AP4042047

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properties of the cadmium grains. The increase in the grain microhardness of commercial Cd after repeated hardening may serve as an indication of an increased density of dislocation loops which form after the first hardening. Not all of these loops are dissolved because of the short holding period and repeated hardening enhances their density. Therefore, initially, microhardness increases continuously. After the hardening of zone molten 99.998% Cd pores were absent and changes in microhardness neglibible. The energy of vacancy formation in commercial Cd was calculated from the magnitude of changes in density after hardening and amounted to 8.5 - 0.8 Kcal/g.mol. A comparison with literary data leads to the conclusion that the mechanism of pore formation as a result of repeated hardening is, indeed, due to vacancies. Orig. art. has: 3 figures.

ASSOCIATION: Sibirskiy fiziko-tekhnicheskiy institut (Siberian Physico-Technical Institute); Tomskiy politekhnicheskiy institut im. S. M. Kirova (Tomsk Polytechnic Institute)

SUBMITTED: 25Mar63 ENCL: 00

SUB CODE: MM NO REF SOV: 018 OTHER: 012

Card 2/2

L 39729-65 EWP(e)/EWT(m)/EWA(d)/EPR/EWP(t)/EWP(k)/EWP(z)/EWP(b) Pf-4/Ps-4

ACCESSION NR: AP5006195 IJP(c) JD S/0226/65/000/002/0078/0082

AUTHOR: Savitskiy, K. V.; Kulikov, V. A.; Itin, V. I.; Kozlov, Yu. I.; Savitskiy, A. P.

TITLE: The effect of temperature on the mechanical properties of metal-powder alloys of copper with aluminum

SOURCE: Poroshkovaya metallurgiya, no. 2, 1965, 78-82

TOPIC TAGS: aluminum alloy, metallurgical research, bronze, compression strength, annealing

ABSTRACT: Because of their excellent mechanical properties, aluminum bronzes are replacing the more expensive tin bronzes. However, the poor casting properties of aluminum bronzes impede their use somewhat. These difficulties may be overcome by substituting powder metallurgy for casting. The authors examine the properties of aluminum bronzes produced by this method. Metal powder alloys with 5, 10 and 15 at. % aluminum are studied. In preparing the alloys, copper and aluminum powders with particles smaller than 50 u were mixed for 50-70 hours.

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L 39729-65
ACCESSION NR: AP5006195

Cylindrical specimens 7 mm in diameter and 14-15 mm high were pressed from this mixture at a pressure of 50 KN/cm^2 . After preliminary annealing in a vacuum, the specimens were pressed for a second time at a pressure of 130 KN/cm^2 and finally sintered in a vacuum of $1.5 \cdot 10^{-3}$. The intermediate annealing temperature for all materials was 700°C, the final sintering temperature: Cu--700°, Cu + 5 at. % Al--850°, Cu +10 at. % Al 850°, Cu+15% Al--950-1000°. The sintered samples were cut off on a lathe to an identical height--11±0.02 mm and then were annealed at a temperature of 700° for 1 hour to remove the cold hardening. These samples were compression tested on an R-5 machine in a temperature range from 20 to 500°C. It is found that Cu-Al alloys produced by the powder metallurgy method have a higher resistance to compression in the temperature range from 20 to 300°C than the cast alloys of corresponding composition. This phenomenon is connected with the presence of oxides in alloys, the extremely fine grain and high inhomogeneity concentration. Homogenization of the powder metal bronzes leads to improvement of the mechanical properties of the alloys at high temperatures in comparison with the non-homogenized bronzes. Hardening of the Cu-Al powder metal alloys during annealing after cold deformation by compression has a number of special features in comparison with cast alloys, in particular such hardening is stable over a wider range of temperatures and is observed at lower

Card 2/3

L 39729-65
ACCESSION NR: AP5006195

aluminum concentrations. Orig. art. has: 5 figures.

ASSOCIATION: Sibirskiy fiziko-tekhnicheskiy nauchno-issledovatel'skiy institut (Siberian Physicotechnical Scientific Research Institute)

SUBMITTED: 13Jun63 ENCL: 00 SUB CODE: MM

NO REF SOV: 013 OTHER: 006

Card 3/3

L 2710-66 EWT(m)/EWP(e)/EWP(w)/T/EWP(k)/EWP(z)/EWP(b)/EWP(t) IJP(c) JD/EM

ACCESSION NR: AP5017182 UR/0139/65/000/003/0124/0128

41
39
B

AUTHOR: Itin, V. I.; Savitskiy, A. P.; Kozlov, Yu. I., Savitskiy, K. V.

TITLE: Influence of the sintering temperature on the mechanical properties of Cu-Al alloy prepared by the method of multiple pressing and sintering

SOURCE: IVUZ. Fizika, no. 3, 1965, 124-128

TOPIC TAGS: copper alloy, aluminum containing alloy, powder metal compaction, powder metal sintering, temperature dependence

ABSTRACT: This is a continuation of earlier work by the authors (Izv. Vuzov SSSR, Fizika, No. 2, 139, 1965) and is aimed at eliminating the pores which appear in Cu-Al alloys sintered at temperatures above the eutectic melting point. To eliminate these defects the authors propose a two-step technology, wherein the pores are eliminated by a second pressing and sintering. The dependence of the hardness and resistance to compression of an alloy of copper with 10 at.% aluminum on the temperature of the sintering was measured at temperature 300, 400, 500, 600, 700, 900, and 1040C. The preparation of the samples and the test procedures are described. The maximum resistance to compression and maximum hardness was obtained at 500C, while best ductility was obtained at 600--700C. The results are analyzed from the point of view of formation of new phases of solid solutions at various

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L 2710-66

ACCESSION NR: AP5017182

temperatures. It is concluded that optimal mechanical properties are obtained by multiple pressing and sintering at 600--700C. The second pressing with subsequent sintering seals the pores and at the same time reduces the number of stress concentrators in the sintered alloy. Variation of the second-sintering temperature and of the pressure permits variation of the grain size and the degree of homogeneity, thus yielding alloys with prescribed properties. Orig. art. has: 5 figures.

ASSOCIATION: Sibirskiy fiziko-tekhnicheskiy institut imeni V. D. Kuznetsova (Siberian Physicotechnical Institute)

SUBMITTED: 12Dec63 ENCL: 00 SUB CODE: MM

NR REF SOV: 005 OTHER: 001

Card 2/2

L 2099-66 EWP(e)/EWT(m)/T/EWP(t)/EWP(k)/EWP(z)/EWP(b)/EHA(c) IJP(c) JD/HW
ACCESSION NR: AP5022547 UR/0226/65/000/009/0081/0090

AUTHOR: Grigor'yeva, V. V.; Savitskiy, K. V.; Zhdanova, V. B.; Kulikov, V. A.; Sergeyenkova, V. M.; Savitskiy, A. P.; Itin, V. I.; Kozlov, Yu. I.

TITLE: Resistance to deformation and stability of deformation-induced distortions of sintered powder alloys

SOURCE: Poroshkovaya metallurgiya, no. 9, 1965, 81-90

TOPIC TAGS: sintered nickel alloy, aluminum oxide containing alloy, dispersion strengthened alloy, alloy deformation resistance, deformation induced distortion, distortion stability, alloy microhardness

ABSTRACT: Compacts of powders of pure nickel and nickel with 1, 3, and 5% of α-Al_2O_3 or γ-Al_2O_3 were sintered at 1200—1400C in a hydrogen atmosphere and tested for compressive strength under compression at a rate of 0.15 mm/min with a reduction of up to 30% at 20 and 500C. The stability of deformation-induced distortions was investigated by measurements of the microhardness of specimens vacuum annealed in the 200—1050C range. The room-temperature compressive strength of sintered nickel alloys with up to 5% Al_2O_3 was slightly higher than that of pure sintered nickel, and the difference was somewhat greater at 500C. At both test temperatures,

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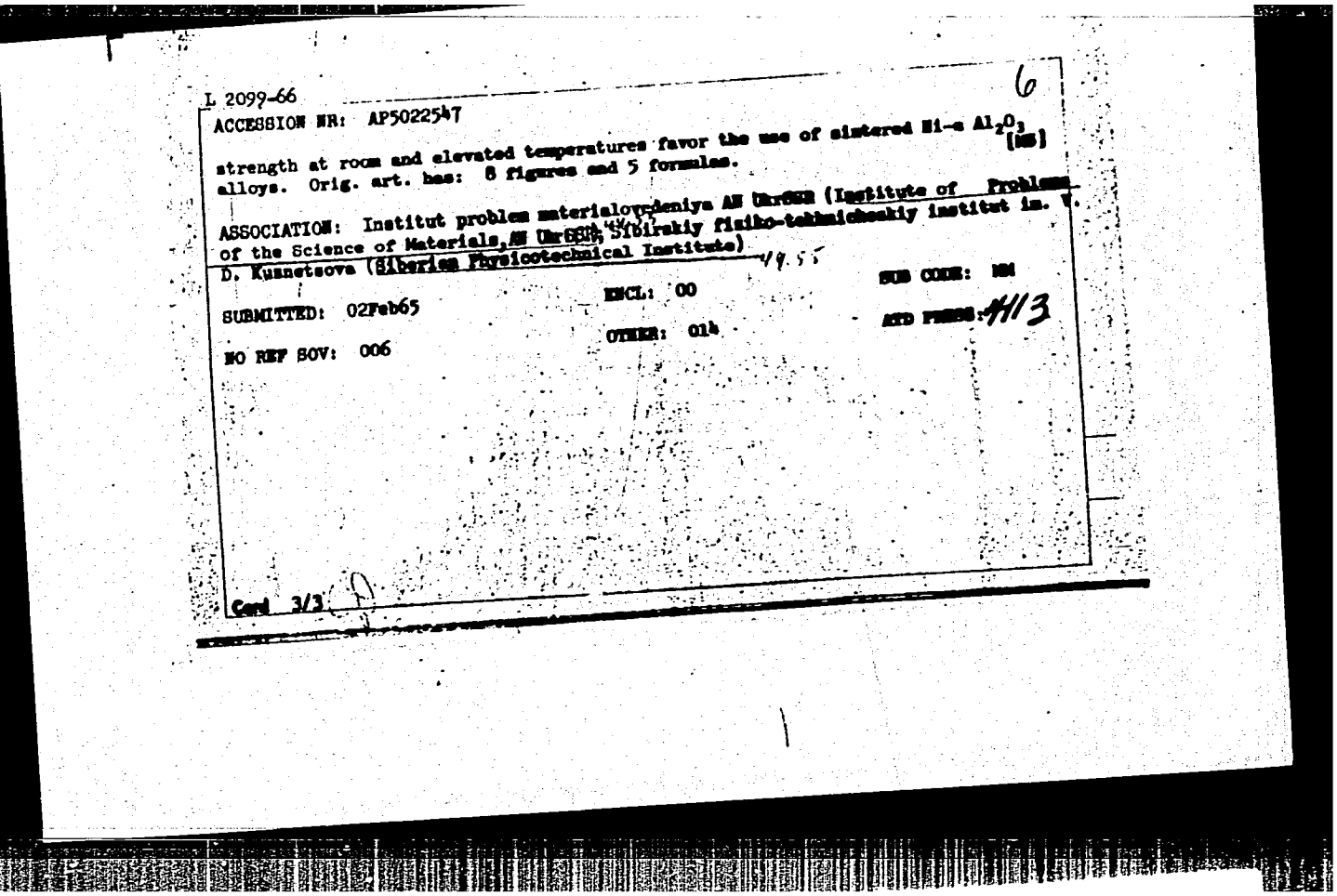
the compressive strength was higher in alloys containing α-Al_2O_3 and slightly increased in all alloys as the Al_2O_3 concentration increased. The size of Al_2O_3 particles had practically no effect on the room-temperature compressive strength, but at 500C the compressive strength of alloys increased appreciably as the particle size of Al_2O_3 decreased from 2 to 1 μ. The type of Al_2O_3 modification had the most sharply pronounced effect on the compressive strength. For example, an alloy with 3% α-Al_2O_3 had a compressive strength of about 65 and 36 dan/mm^2 at 20 and 500C, respectively, compared with 58 and 28 dan/mm^2, respectively, for an alloy with 3% γ-Al_2O_3. Low-temperature annealing (at up to 300—400C) produced an equally slight increase in the hardness of both nickel and Ni-Al_2O_3 alloys deformed 30% at 20C. Annealing at temperatures higher than 400C decreased the hardness of sintered nickel and all Ni-Al_2O_3 alloys. However, the hardness of cold-deformed Ni-Al_2O_3 alloys after high-temperature annealing remained higher than that of identically treated sintered nickel. The hardness level of Ni-Al_2O_3 alloys increased with higher content and fineness of Al_2O_3 powder. The maximum softening of Ni and Ni-γ Al_2O_3 alloys occurred at the same temperature, while the temperature of maximum softening of Ni-α-Al_2O_3 alloys was about 100C higher. The higher temperature stability of the deformation-induced distortions and a higher compressive

Card 2/3



L 2099-66

ACCESSION NR: AP5022547

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strength at room and elevated temperatures favor the use of sintered Ni-a Al_2O_3 [MS] alloys. Orig. art. has: 8 figures and 5 formulas.

ASSOCIATION: Institut problem materialovedeniya AN UkrSSR (Institute of Problems of the Science of Materials, AN UkrSSR); Sibirskiy fiziko-tekhnicheskiy institut im. V. D. Kuznetsova (Siberian Physicotechnical Institute)

SUBMITTED: 02Feb65 ENCL: 00 SUB CODE: MM

NO REF SOV: 006 OTHER: 014 ATD PRESS: 4113

Card 3/3

SAVITSKIY, K.V.; ITIN, V.I.; KOZLOV, Yu.I.; SAVITSKIY, A.P.

Effect of the dispersity of an aluminum powder on the sintering of the Cu-Al alloy in the presence of the liquid phase. Poroshk. met. 5 no.11:19-25 N '65. (MIRA 18:12)

1. Sibirskiy fiziko-tekhnicheskiy institut imeni V.D.Kuznetsova.
Submitted February 13, 1965.

ITIN, V.I.; SAVITSKIY, A.P.; SAVITSKIY, K.V.; KOZLOV, Yu.I.; KULIKOV, V.A.

Sintering of the metal ceramic alloy Cu - Al. Izv. vys. ucheb. zav.; fiz. 8 no.2:139-144 '65. (MIRA 18:7)

1. Sibirskiy fiziko-tekhnicheskiy institut imeni Kuznetsova.

L 46662-66 EWP(e)/EWT(m)/T/EWP(t)/ETI/EWP(k) IJP(c) JD/WW/JG/JH

ACC NR: AP6009571 (N) SOURCE CODE: UR/0226/65/000/011/0019/0025

AUTHOR: Savitskiy, K. V.; Itin, V. I.; Kozlov, Yu. I.; Savitskiy, A. P. 49 B

ORG: Siberian Physico-Technical Institute im. V. D. Kuznetsov (Sibirskiy fiziko-tekhnicheskiy institut im. V. D. Kuznetsova)

TITLE: Effect of the dispersion of aluminum powder on the sintering of Cu-Al alloy in the presence of liquid phase

SOURCE: Poroshkovaya metallurgiya, no. 11, 1965, 19-25

TOPIC TAGS: powder metal sintering, aluminum, copper, powder alloy, particle size

ABSTRACT: The sintering of pressed shapes whose components can form eutectic alloys may, owing to contact pressure, involve formation of the liquid phase at temperatures markedly below the melting point of the readily fusible component. The formation of the liquid phase in Cu-Al alloys triggers two opposite processes: shrinkage or enlargement of the pressed briquet, either one of which prevails depending on pressing and sintering conditions, as well as on the particle size of aluminum powder. To further clarify these conditions, the authors investigated a powder-metal alloy of Cu with 10 at.% Al. The samples investigated contained Al powder in

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L 46662-66

ACC NR: AP6009571

different particle sizes: <50 μ, 63-100 μ, 100-160 μ, 250-315 μ, and 400-630 μ, mixed with Cu powder (particle size <50 μ). These mixtures were pressed into cylindrical briquets which were then vacuum-sintered. After sintering the linear and volumetric shrinkage of the briquets was determined. Findings: samples sintered at above-eutectic temperatures (>548°C) undergo enlargement in volume; the extent of this enlargement is the greater the finer the particle size of Al is and the slower the rate at which the samples are heated to the temperature of isothermal exposure. The formation of the liquid phase, as established by radiographic and metallographic analyses, is the major factor in this process: the growth in the size of the sintered briquets is chiefly associated with the formation of an alloy of copper and aluminum owing to the preferential diffusion of Al atoms from the liquid to the solid phase. If the diffusion is not complete, the briquets may undergo shrinkage instead of expansion in volume. Smaller Al particles are more advantageous, since then the area of contact between Cu and Al particles in the briquets is greater and this contributes to a more complete diffusion from the liquid to the solid phase. Orig. art. has: 6 figures.

SUB CODE: 11, 20, 13/ SUBM DATE: 13Feb65/ ORIG REF: 007/ OTH REF: 003

Card 2/2

ACC NR: AP7000663 SOURCE CODE: UR/0126/66/022/005/0789/0791

AUTHOR: Berzina, I. G.; Savitskiy, A. P.

ORG: Siberian Physicotechnical Institute im. V. D. Kuzhetsov (Sibirskiy fiziko-tekhnicheskiy institut)

TITLE: Redistribution of impurities in metals during irradiation and recovery

SOURCE: Fizika metallov i metallovedeniye, v. 22, no. 5, 1966, 789-791

TOPIC TAGS: metal property, neutron irradiated metal, irradiated metal property, IRRADIATION EFFECT, METAL MELTING, STEEL IMPURITY

ABSTRACT: The effect of irradiation on the redistribution of impurities in metals has been evaluated from the rate of contact melting of bismuth-tin, lead-tin, and cadmium-tin pairs subjected to irradiation from an Ra-a-Be source. It was found that irradiation greatly increased the melting rate of irradiated pairs. However, within a few hours, the melting rate dropped sharply below the original value (prior to irradiation) and in 20—80 hr (depending on the metal pair) returned to an original value. Such behavior is assumed to be the result of the combined effect of irradiation-induced defects and impurities accumulated at grain boundaries. Freshly irradiated specimens contain a large quantity of defects which greatly increases the melting rate. Recovery lowers the number of defects and the melting rate. This assumption, however, does not account for the long period of time during which the melting rate remains at values lower than the original values. Orig. art. has: 1 figure.

SUB CODE: 13/ SUBM DATE: 27Dec65/ ORIG REF: 003/ OTH REF: 002/

Card 1/1 UDC: 669.017.539.16.04

ACC NR: AP7004394 (A) SOURCE CODE: UR/0226/67/000/001/0031/0036

AUTHOR: Savitskiy, K.V.; Grigor'yeva, V.V.; Kulikov, V.A.; Savitskiy, A.P.; Sergeyenkova, V.M.

ORG: Siberian Physicotechnical Institute im. V.D. Kuznetsov (Sibirskiy fiziko-technicheskiy institut)

TITLE: Investigation of the properties of extruded nickel-aluminum oxide alloy

SOURCE: Poroshkovaya metallurgiya, no. 1, 1967, 31-36

TOPIC TAGS: nickel alloy, ~~dispersion strengthened nickel alloy~~, aluminum oxide ~~containing alloy, nickel alloy property~~ powder metal sintering, powder metal compaction, metal extrusion, grain growth, porosity

ABSTRACT:

A mixture of metallic nickel and various amounts of aluminum oxide powders (1—5%) was compacted under a pressure of 15 kg/cm^2 into billets 25 mm in diameter and 35 mm long. One group of billets was sintered in hydrogen atmosphere at 1000°C for 2—3 hr and extruded into bars 10 mm in diameter. Another group was sintered at 1300°C without subsequent extrusion. Specimens, 6.5 mm in diameter and 10.5 mm in length, cut from the billets, were annealed at 700°C for 2 hr. It was found that alloying with aluminum oxide

Card 1/2 UDC: none

ACC NR: AP7004394

prevents grain growth. Extruded specimens, however, had a finer grain and block structure and higher density than sintered billets. Sintered specimens containing 1% aluminum oxide retained up to 6% of their porosity, while the porosity of extruded specimens was practically nil. Alloying with aluminum oxide also increased the compression strength, particularly in the case of extruded alloys. For instance, the deformation pressure for 10% reduction of extruded powdered nickel specimens was 28 kg/mm^2, that for sintered nickel alloy specimens (containing 3% Al_2O_3) was 43 kg/mm^2, and that for extruded alloy specimens of the same composition was 54.5 kg/mm^2. Orig. art. has: 2 figures and 3 tables. [TD]

SUB CODE: 11/ SUBM DATE: 04Aug66/ ORIG REF: 008/ OTH REF: 001
ATD PRESS: 5116

Card 2/2

NAUMENKO, G.V.; SAVITSKIY, A.TS.

Continuous copying-milling device. Mashinostroitel' no.3:11 Mr '63. (MIRA 16:4)
(Milling machines—Numerical control)

SAVITSKIY, A. V.

USSR/Chemistry - Mercury Organic Compounds

21 Jul 52

"The Reaction Between Symmetrical Organo-Mercury Compounds and Iodine," G. A. Razuvayev, A. B. Savitskiy, Gor'kiy State

"Dok Ak Nauk SSSR" Vol 85, No 3, pp 575-578

In order to learn the effect of neg charges at radicals attached to metals on the reactions which the compds in question undergo, the reaction between sym organo-mercury compds and iodine was studied. The kinetics were worked out and it was concluded that the react on differs in nature from that with hydrogen halide acids. Increasing the neg charge of the reaction and a quant change in the kinetic parameters. Presented b Acad A. N. Nesmeyanov 16 May 52

PA 335T16

1. SAVITSKIY, A. V.

2. USSR (600)

4. Chemistry, Organic

7. Empirical formula for the calculation of the energies of dissociation of organic molecules, Dokl. AN SSSR, 87, No. 4, 1952.

An empirical formula for the calcn of dissocn energies of org mols was developed and tested. A table is given listing the exptl and calcd values for a number of org mols.

256T16

9. Monthly List of Russian Accessions, Library of Congress, February 1953. Unclassified.

Savitskiy, A.V.

USSR/ Chemistry - Isotopic exchange

Card 1/1 Pub. 22 - 26/49

Authors : Miller, V. B.; Neyman, M. B.; Savitskiy, A. V.; and Mironov, V. F.

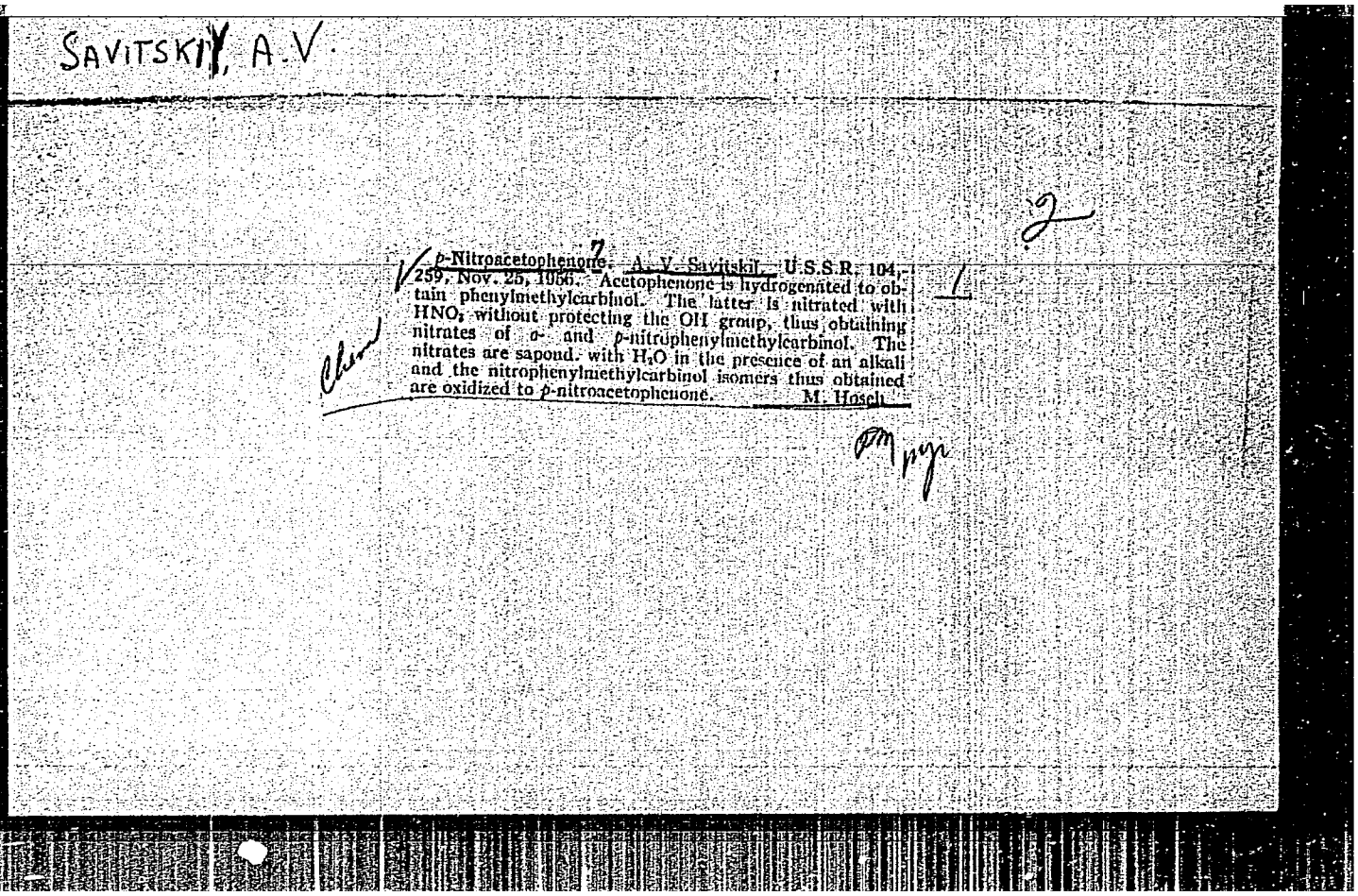
Title : Study of the ion isotopic exchange of alpha-iodalkyltrialkylsilanes with iodine ions

Periodical : Dok. AN SSSR 101/3, 495-497, Mar 21, 1955

Abstract : The isotopic exchange of $(CH_3)_3SiCH_2J$, $(C_2H_5)_3SiCH_2J$ and $(C_2H_5)_3SiCHJCH_3$ with sodium iodide was investigated in a 90% C_2H_5OH solution. The radioisotope J^{131} with a life span of 8.0 days was employed in the role of the marked atom. The results obtained are shown in graphs. The rate of the ion exchange was determined by the energetic barrier which the carbon atom must penetrate when passing through the face of the tetrahedron the apexes of which are occupied by three substitutes. Ten references: 8 USSR and 2 USA (1935-1954). Tables; graphs.

Institution : Acad. of Sc., USSR, Inst. of Chem. Phys.

Presented by : Academician V. N. Kondratyev, October 23, 1954



SAVITSKII, A.V.

p-Nitroacetophenone. A. V. Savitskii. U.S.S.R. 104,259, Nov. 25, 1956. Acetophenone is hydrogenated to obtain phenylmethylcarbinol. The latter is nitrated with HNO_3 without protecting the OH group, thus obtaining nitrates of o- and p-nitrophenylmethylcarbinol. The nitrates are saponified with H_2O in the presence of an alkali and the nitrophenylmethylcarbinol isomers thus obtained are oxidized to p-nitroacetophenone. M. Hosch

SAVITSKIY, A.V.

NEZHUTA, Ye.I.; SAVITSKIY, A.V.

New method of p-nitroacetophenone synthesis. Med.prom. 10 no.4:9-10 O-D '56. (MLRA 10:2)

1. Moskovskiy khimiko-farmatsevticheskiy zavod "Akrikhin"
(ACETOPHENONE)

SAVITSKIY, A.V.

Distr: 4E4j/4E2c(j)

Synthesis and properties of derivatives of methylphenyl-carbinol. B. I. Nezhuta and A. V. Savitskii. *Zhur. Obshchei Khim.* 27, 1079–80(1957).—Through 70 ml. HNO_3 (d. 1.5) was passed a stream of CO_2 at 50° with addn. of 4 g. urea; the *N*-oxide free HNO_3 was then treated with 0.2 g. *p*-$H_2NC_6H_4SO_3H$ followed by 20 g. MePhCHOH at −5°; after treatment with ice there was obtained 40% *p*-$O_2NC_6H_4CHMeONO_2$, m. 50–1° (MeOH), and 16.8 g. mixed *o*-*p* isomers; the *p*-isomer, $b_{[illegible]}$ 130–3°. Addn. of 12.5 ml. H_2SO_4 to 25 ml. MePhCHOH and 50 ml. ROH with ice cooling followed by 2 hrs. at 55° gave the following ethers of MePhCHOH (*R* of ether shown): *Me*, 80.5%, $b_{[illegible]}$ 70–2°, n_D^{20} 1.493; *Et*, 78%, $b_{[illegible]}$ 70–2°, n_D^{20} 1.487; *iso-Pr*, 35%, $b_{[illegible]}$ 82–4°, n_D^{20} 1.486; in all cases 5% $(PhMeCH)_2O$, $b_{[illegible]}$ 103–5°, d_{20} 1.00, n_D^{20} 1.539, also formed. Nitration of the Me ether as described above gave 35% *p*-$O_2NC_6H_4CHMeO$-NO_2 (I); the Et ether gave a 30% yield. Heating I with 3% aq. urea 8 hrs. at 100° gave *p*-$O_2NC_6H_4CMeHOH$. Oxidation of this with CrO_3 gave 83% *p*-nitroacetophenone. The mixed isomers of the nitro derivs. obtained in the above nitration on similar hydrolysis and oxidation gave up to 40% *p*-nitroacetophenone.

G. M. Kosolapoff

3
2 May

KOCHERGIN, P.M.; BLINOVA, L.S.; TITKOVA, R.M.; SAVITSKIY, A.V.; ZASOSOV, V.A.
GRIGOROVSKIY, A.M. [deceased]

New method for producing p-nitroacetophenone from phenylmethylcarbinol.
Med.prom.SSSR 12 no.5:33-36 My '58. (MIRA 11:5)

1. Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy institut imeni S.Ordzhonikidze.
(ACETOPHENONE) (BENZYL ALCOHOL)

AUTHORS: Savitskiy, A. V.; Syrkin, Ya. K., SOV/ 2o-12o-1-32/63
Corresponding Member, Academy of Sciences

TITLE: The Kinetics of the Oxidation of Ferrocene by Iodine (Kinetika okisleniya ferrotsena iodom)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol. 12o, Nr 1, pp. 119 - 121 (USSR)

ABSTRACT: The conversion of ferrocene into another ferrocinium ion is of interest because in this process one ion is converted under the conditions of a solution. Because of the great electrostatic repulsion of the equally charged ions the reaction must take place at a sufficiently great distance. Such reactions can be characterized by small transmission coefficients. In the electrically neutral ferrocene molecules $Fe(C_2H_5)_2$ and in iodine the conversion of the electron can take place at a small distance. The following two schemes for the course of the reaction are possible:

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The Kinetics of the Oxidation of Ferrocene by Iodine 30V/2o-12o-1-32/63

$$\left.\begin{array}{l} Fn + J_2 \underset{k_2}{\overset{k_1}{\rightleftarrows}} Fn^+ + J_2^- \\ Fn + J_2^- \xrightarrow{k_3} Fn^+ + 2J^- \end{array}\right\} \text{scheme 1} \qquad \left.\begin{array}{l} Fn + J_2 \rightleftarrows Fn^+ + J + J^- \\ Fn + J \longrightarrow Fn^+ + J^- \end{array}\right\} \text{scheme 2}$$

Ferrocene is abbreviated as Fn. Scheme 1 is more probable. The authors give the expression

$$\frac{d\left[Fn^+\right]}{dt} = \frac{2k_1k_3\left[Fn\right]^2\left[J_2\right]}{k_2\left[Fn^+\right] + k_3\left[Fn\right]}$$ for the velocity of oxidation, which then is specialized by simplification. Perhaps the reaction takes place with a previous formation of a molecular compound FnJ_2 in which the ferrocene occurs as donor of an electron. The authors studied the oxidation of ferrocene by iodine in 93- and 96% alcohol. In the case of an iodine excess the equilibrium of the reaction $Fn + 3/2\ J_2 \rightleftarrows Fn^+ + J_3^-$ is dislocated to the side of the production of ions. The velocity of the existing

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experimental conditions is low for which reason it can be neglected in the investigation of the kinetics of the oxidation. The course of the change of the concentration of the ferrocinium ions is in every experiment described by the equation $d\left[Fn^+\right]/dt = k(\left[Fn\right]_o - \left[Fn^+\right])^2$, where k denotes a constant quantity. The kinetic data do not contradict the condition of the intermediate formation of an instable radical ion J_2^-.

The activation energy and the factor before the exponent for the conversion of the electron from the ferrocene to the iodine are determined graphically from the temperature dependence of the velocity of reaction. The experiment supplied the following data: for the activation energy 14,6 kcal.mol^{-1} and for the factor before the exponent the value 9.10^{11} l.mol^{-1} sec^{-1}. There are 2 tables and 9 references.

ASSOCIATION: Institut tonkoy khimicheskoy tekhnologii im.M.V.Lomonosova (Institute of Fine Chemical Technology imeni M.V.Lomonosov)

The Kinetics of the Oxidation of Ferrocene by Iodine SOV/20-120-1-32/63

SUBMITTED: January 14, 1958

1. Iron compounds--Oxidation 2. Ions--Reaction 3. Iodine --Applications 4. Mathematics--Applications

Card 4/4

66479

SOV/20-129-1-25/64

~~24(6)~~ 18.8400, 24.4100

AUTHORS: Zhurkov, S. N., Corresponding Member, AS USSR, Savitskiy, A. V.

TITLE: On the Mechanism of the Failure of Solids

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 129, Nr 1, pp 91 - 93 (USSR)

ABSTRACT: At first, various previous papers are discussed by the authors. B. Ya. Pines (Refs 11,12) proceeded from the hypothesis that a gap widens due to the flow of vacancies, which diffuse from the interior to their orifice. On the basis of this assumption he developed a theoretical expression for the life of solid bodies under stress which, with respect to its form, agrees with that found experimentally. However, the activation energy determining the velocity of the gap growth, equals, on the basis of data by Pines, the energy of selfdiffusion, which is less by about 20-30% than the corresponding experimental values. It was the aim of the present paper to verify the diffusion theory of the gap [redacted] which causes the failure of the sample. For this purpose, the activation energy U_o of the destruction was determined from the dependence of strength on temperature. U_o is then compared with the sublimation and selfdiffusion energy, which were

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On the Mechanism of the Failure of Solids

found by the authors by the method of radioactive indicators. In all investigations the same polycrystalline silver (99.99% Ag) was applied. Investigations were made in a large range of temperature and time. The results of these investigations confirm the formula

$$\tau = \tau_o \frac{U_o - \gamma\sigma}{kT}$$ which has already been found before. In this case

τ denotes the life-time, that is the time from the beginning of stress application to the failure of the sample, σ = stress, T = temperature. The computed values of the coefficients τ_o, γ, and U_o are summarized in a table. The sublimation energy λ of silver, determined by the alteration of the steam pressure, agrees well with measurements made by other authors. The self-diffusion coefficient D of the same (radioactively tagged) silver was measured by the absorption method within the temperature range 460° to 920° C. A table illustrates the energy of selfdiffusion computed from it. The activation energy U_o of the destruction process practically agrees with λ with respect

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to the magnitude. On the strength of these results the authors concluded that the correctness of the said diffusion mechanism of the growth of the gaps is doubtful. To confirm this conclusion, the authors tried to demonstrate that U_o deviates not only qualitatively but also quantitatively from the energy of selfdiffusion. For this purpose a solid solution of silver with 5 at% aluminum, was investigated. The energy of selfdiffusion decreased by 30%, on adding aluminum to silver, whereas the energy of destruction and the sublimation energy remained unchanged. This indicates the lack of a correlation between U_o and the energy E_a of selfdiffusion. According to the results of present paper no relation exists between selfdiffusion and life of a solid body. The increase of a gap in a solid does not depend on the mobility of atoms, depending on diffusion. This applies also to other proposed processes, which are based mainly on the importance of diffusion with respect to the destruction of metals. There are 4 figures, 1 table, and 19 references, 14 of which are Soviet.

66479

On the Mechanism of the Failure of Solids SOV/20-129-1-25/64

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk SSSR (Institute of Physical Engineering of the Academy of Sciences, USSR)

SUBMITTED: July 20, 1959

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Card 4/4

87173

S/062/60/000/012/018/020
B013/B054

5 3700

AUTHORS: Savitskiy, A. V. and Syrkin, Ya. K.

TITLE: Equilibrium Reactions of Ferrocene and Ruthenocene Oxidation With Iodine

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1960, No. 12, pp. 2254-2256

TEXT: The authors briefly report on a study of the absorption spectra of ternary Fc-I_2-C_6H_6 and Rc-I_2-C_6H_6 systems, which was conducted to determine the thermodynamic characteristics (ΔF, ΔH, ΔS) of ferrocene (Ref. 1) and ruthenocene oxidation with iodine. The following designations are used: Fc is $(C_5H_5)_2Fe$; Rc is $(C_5H_5)_2Ru$; Me is dicyclopentadienyl metal $(C_5H_5)_2Me$. Iodine sublimated in the usual way, and ruthenocene and ferrocene purified by sublimation in vacuo, were used in the experiments. The measurements were made on apparatus of the types CФ4 (SF4) and CФ2M (SF2M) at different temperatures in a glass bulb (d=4.33 cm) kept at

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constant temperature. The two apparatus gave agreeing results. The $Fc-I_2-C_6H_6$ system was investigated in Ref. 4. This paper studied the deviation of the optical density D from the addition value D_o at different wavelengths (Fig. 1). The same figure gives the absorption spectrum of $(CH_3)_3C_6H_5NI_3$ as a calibration measure for the optical density of the triiodide ion. The experiments revealed the existence of a linear dependence $(D - D_o)\,[Fc]_o^{-1}\,[I_2]_o^{-3/2} = a + b[I_2]_o$ (Fig. 2). a and b are empirical constants. A similar dependence was observed in the system $Rc-I_2-C_6H_6$ (Fig. 3). A comparison of these dependences with the absorption spectra of $(CH_3)_3C_6H_5NI_3$ and $(CH_3)_3C_6H_5NI_5$ (Fig. 4) confirmed the assumption concerning the origin of FcI_3 and FcI_5. The equilibrium constants were found from the corresponding constants a and b at different temperatures. The values of the equilibrium constants K_1 and K_2 are given in Table 1, the values of ΔF, ΔH, and ΔS in Table 2. The different oxidation rate of ferrocene and ruthenocene observed can be explained by the

Equilibrium Reactions of Ferrocene and Ruthenocene Oxidation With Iodine

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B013/B054

fact that the activation energies are determined by the quantity ΔE of the electron transfer. The calculation shows that the electron transfer is weakly endothermic, and that ΔH in the case of ruthenocene is by 1.5 kcal·mole^{-1} smaller than in the case of ferrocene. On the basis of data given in Table 2, the value of ΔH can be determined for the reaction $Rc + FeI_3 = RcI_3 + Fc$ in benzene. In this case, it is 1.5 kcal · mole^{-1}. Ruthenocene is thermodynamically stabler than ferrocene. The bond of the metal with the ring, which is more solid in ruthenocene, is confirmed by the study of infrared spectra of the two compounds (Ref. 8). On the basis of these data, and the similar values of ionization potentials, it may be concluded that the ruthenicinium cation is thermodynamically stabler than the ferricinium cation. There are 4 figures, 2 tables, and 8 references: 1 Soviet, 4 US, 2 British, and 1 German.

ASSOCIATION: Institut tonkoy khimicheskoy tekhnologii im.M.V. Lomonosova (Institute of Fine Chemical Technology imeni M.V.Lomonosov)

SUBMITTED: May 25, 1960

Card 3/3

BETEKHTIN, V.I.; ZHURKOV, S.N.; SAVITSKIY, A.V.

Effect of additions on the temperature-time relation of metal strength. Fiz. met. i metalloved. 10 no.3:453-461 S '60. (MIRA 13:10)

1. Fiziko-tekhnicheskiy institut AN SSSR, Leningrad.
(Alloys--Testing) (Metals, Effect of temperature on)

85041

S/126/60/010/004/010/023
E193/E483

18.7500 2308, 1555, 1418 only

AUTHOR: Savitskiy, A.V.

TITLE: On the Problem of the Effect of Stress and Deformation on Self-Diffusion

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol.10, No.4, pp.564-571

TEXT: Prompted by contradictory reports on the part played by stress and deformation on the processes of self-diffusion, the present author investigated the effect of these factors on self-diffusion in 99.99% purity silver and 0.1% C steel. Self-diffusion in silver was studied at 460 to 790°C on specimens subjected either to uniaxial tension, with the stress varying between 0.4 and 1.2 kg/mm^2, or to uniaxial compression, with the stress varying between 1 and 23 kg/mm^2, the corresponding deformation limits being 5 and 70%. In the case of steel, the experiments were carried out at 720 to 800°C on a specimen subjected to uniaxial tension with the applied stress varying between 0.9 and 1.4 kg/mm^2. Unstressed specimens were used as controls in all the experiments. The self-diffusion coefficients, D, were measured by the absorption method, with the aid of

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